



SPECK "Pumpmeister" Pumps and Pump Units PM10 PM15 PM20 PM30 FPM80 FPM100 FPM150

1. In General

Each individual pump undergoes a lengthy run on our test stand before it leaves our works. The assembled pump units comply with the EC guidelines for machinery, 89/329/EWG, Annex II, A.

1.1 Application

SPECK piston pumps are used for pumping drinking and general domestic water in -

• Single / Multi-storey Houses • Agriculture/Farming • Gardens/Green Houses • Ships • Industry

Standard piston pumps and pump units are not to be used for conveying any medium other than water, except if written consent is given by the manufacturer. Special versions are built by us for the pumping of other media.

1.2 Economy

Speck piston pumps save energy. They only require 0.25 kW/h to pump 1 cbm of water. The comparatively high price of a piston pump is rewarded in time by its low power consumption and long-working life.

1.3 Accessories

A belt-guard is available for V-belt drive. The law on technical appliances obligates the manufacturer to always supply a belt-guard, even with pumps without motors. Please pay attention to this when ordering.

Declaration of Conformity		Declaration of the Manufacturer	
We herewith declare			
that the following pump units: "Pumpmeister" Pump with Motor: PM10 PM15 PM20 PM30 Fresh Water Pump Unit: FPM80 FPM100 FPM150		that the following Pumps without motor: PM10 PM15 PM20 PM30	
		Pump Units: PM10/100L Pressure Tank PM10/150L Pressure Tank PM15/100L Pressure Tank PM15/150L Pressure Tank PM15/200L Pressure Tank PM20/150L Pressure Tank PM20/200L Pressure Tank PM20/300L Pressure Tank PM30/300L Pressure Tank	
comply with pertinent stipulations as per: EC Machine Guidelines 89/392/EWG Applied compatible standards: EN 809 EN 292 T1 EN 292 T2 Electromagnetic Compatibility: 89/336/EWG Applied compatible standards: EN50 081-1 EN50 082-2 Use of Electrical Equipment within specified Voltage Limits: 73/23/EWG Applied compatible standards: EN60 335-1 EN60 335-2-51			
		 ppa. (Technical Director)	

Country of Origin: Federal Republic of Germany

SPECK - KOLBENPUMPENFABRIK

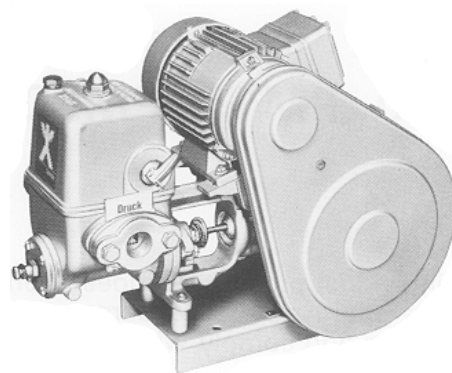
Otto Speck GmbH & Co. KG · P.O. Box 1240 · D-82523 Geretsried

Tel. (08171) 62930 · Telefax (08171) 629399

1.4 Technical Data and Dimensions

Pumpmeister

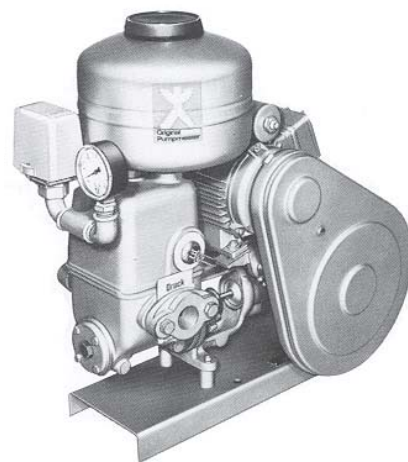
Model		PM10	PM15	PM20	PM30
Flow Rate	l/h	1000	1500	2000	3000
Water Head normal/maximum	m	40/60	40/60	40/60	40/60
Motor Performance at 40m	kW	0.25	0.37	0.37	0.55
Motor Performance at 60m	kW	0.37	0.55	0.55	0.75
No. of V-Belts		1	1	2	3
Profile x Inner Length		10 x 875	10 x 875	10 x 950	10 x 1230
Connection Sizes Suction x Discharge	Inch	1 x 1	1 x 1	1 ¼ x 1	1 ¼ x 1 ¼
Dimensions approx.	cm	52x23x35	52x23x37	61x24x40	70x27x52
Weight w/o Motor approx.	kg	23	24	33	55



Pumpmeister

Freshwater Pump Units

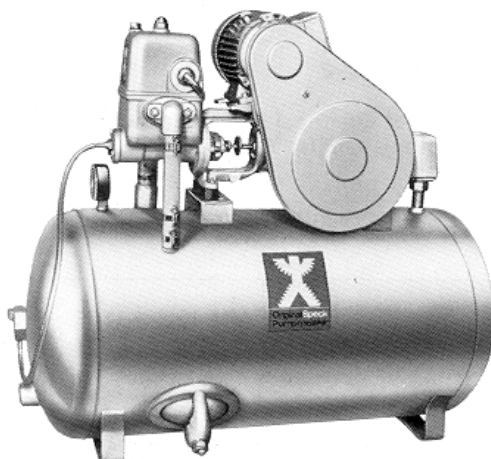
Model		FPM80	FPM100	FPM150
Flow Rate	l/h	800	1000	1500
Water Head	m	40	40	40
Motor Performance	kW	0.25	0.25	0.37
Switch-On Pressure	bar	2	2	2
Switch-Off Pressure	bar	3.5	3.5	3.5
V-Belts Profile x Inner Length	mm	10 x 875	10 x 875	10 x 875
Connection Sizes Suction x Discharge	Inch	1 x 1	1 x 1	1 x 1
Dimensions approx.	cm	57x23x68	57x23x68	57x23x68
Weight w/o Motor approx.	kg	26	27	27



Freshwater Pump Unit

Pump Units – Pump with Horizontal Tank

Pump Model	Size of Tank (liter)	Connection Sizes Suct./Disch. (inch)	Flow Rate (l/h)	Motor Performance (kW)	Dimensions (L x W x H)	Weight (approx. kg)
PM10	100 150	1 x 1	1000	0.25	88 x 40 x 79 105 x 45 x 84	60 70
PM15	100 150 200	1 x 1 1 ¼ x 1	1500	0.37	88 x 40 x 85 105 x 45 x 89 107 x 50 x 94	61 71 83
PM20	150 200 300	1 x 1 1 ¼ x 1	2000	0.37	105 x 45 x 90 107 x 50 x 95 140 x 55 x 98	80 92 97
PM30	300	1 ¼ x 1	3000	0.55	140 x 55 x 120	120



Pumpmeister Pump Unit

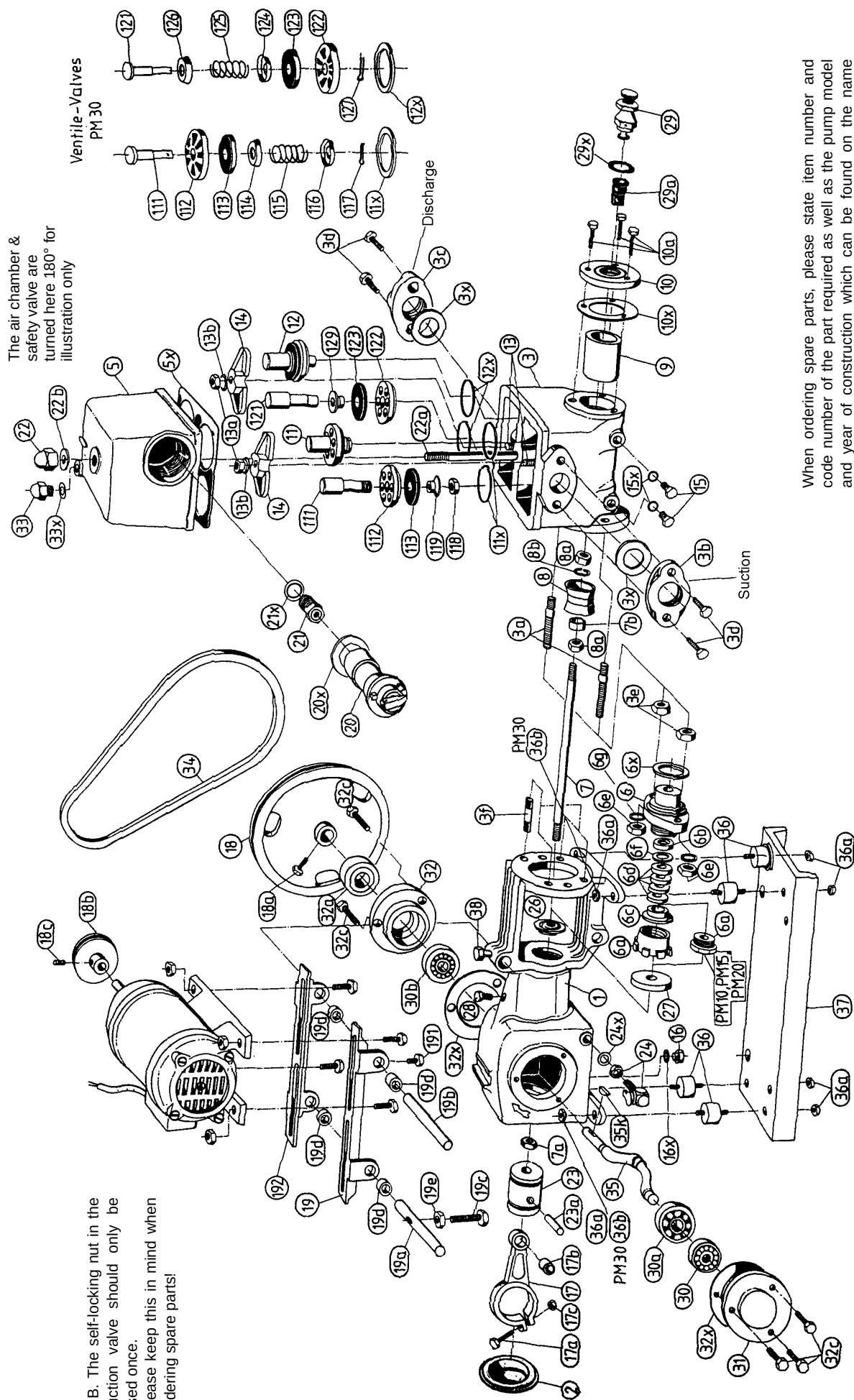
1.5 Spare Parts Section

1.51 Spare Parts List

Part No.	Description	PM10	PM15	PM20	PM30
1	Crankcase	01.0033	01.0336	01.0151	01.0152
2	Gear Cover	03.0096		03.0120	03.0097
3	Valve Casing Assy w. Cylinder, Studs and Nuts	00.2380	00.2381	00.2382	00.2383
3a	Flange Stud Bolt	21.0196		21.0045	21.0022
3b	Suction Flange	20.0030	20.0031	20.0069	20.0032
3c	Discharge Flange	20.0030	20.0031		20.0032
3d	Hexagon Screw	21.0258	21.0062		21.0188
3e	Hexagon Nut	07.3001		07.2398	
3f	Flange Stud Bolt	-	-	-	21.0023
3x	Flange Gasket	06.0386	06.0387		06.0400
	Air Chamber w/SV 4 bar and Filler Plug	00.2395	00.2396	00.2397	00.2398
	Air Chamber w/SV 6 bar and Filler Plug	00.2424	00.2425	00.2426	00.2427
5	Air Chamber w/o Safety Valve	01.0023	01.0341	01.0232	01.0154
5x	Air Chamber Gasket	06.0085		06.0086	06.0087
6	Stuffing Box Casing	01.0150	01.0339	01.0208	01.0155
6a	Stuffing Box Screw	07.2879		07.2875	07.1291
6b	Seal Ring	06.0388		06.0403	06.0411
6c	Stuffing Box Insert	-	-	-	07.1292
6d	Gland Packing Ring	06.1087		06.1089	06.1136
6e	Hexagon Nut	07.3001		07.2398	
6f	Brass Disc	07.1249		07.1286	07.1293
6g	Disc for 6e	07.2904		-	-
6x	Stuffing Box Gasket	06.0387	06.0400		06.0413
	Stuffing Box complete	00.2251	00.2252	00.2253	00.2254
	Piston Rod Assy with Spring Ring and Nuts	00.2388		00.2389	00.2390
7	Piston Rod	11.0030		11.0233	11.0046
7a	Hexagon Nut	07.3001		07.2398	07.0988
7b	Reducing Ring for DUO-Piston	-	07.0630	-	-
8	DUO-Piston Simrit	06.0876	06.0875		06.0874
8a	Hexagon Nut	07.3001		07.2398	07.0988
8b	Spring Ring	07.2994		07.3196	07.3197
9	Cylinder Pipe	22.0209	22.0028	22.0029	22.0012
10	Cylinder Cover	03.0095	03.0039		03.0035
10a	Hexagon Screw	21.0256			21.0366
10x	Gasket for Cylinder Cover	06.0390	06.0401		06.0414
11	Suction Valve Assy	00.2170	00.2071		00.1291
111	Suction Valve Stem	07.2539			07.1220
112	Suction Valve Seat (Brass)	07.0021	07.0023		07.0065
118	Self-Locking Hexagon Nut	07.0669			-
12	Discharge Valve Assy	00.2171	00.2072		00.1292
121	Discharge Valve Stem	07.2540			07.1219
122	Discharge Valve Seat (Brass)	07.0020	07.0022		07.2608
119/129	Suction / Discharge Valve Retainer	07.2538			-
113/123	Suction / Discharge Rubber Valve Plate	06.1065	06.1066		06.0857
114/124	Suction / Discharge Spring Tension Disc (large)	-	-	-	07.1939
115/125	Suction / Discharge Valve Spring	-	-	-	07.3662
116/126	Suction / Discharge Spring Tension Disc (small)	-	-	-	07.1360
117/127	Cotter Pin	-	-	-	07.1215
11x/12x	Gasket for Valve Seat	06.0391	06.0405		06.0416
13	Valve Bridge Stud Bolt	21.0002	21.0194		21.0046
13a	Hexagon Nut	07.3001	07.2398		
13b	Disc	07.2904	-		-
14	Valve Bridge	03.0268			03.0042
15	Plug	07.0487			
15x	Gasket	06.0054			
16	Plug	-	-	-	07.0487
16x	Gasket	-	-	-	06.0054
17	Connecting Rod Assy	00.2421	00.2422		00.2423
17a	Tension Screw for Con Rod	21.0293			21.0308
17b	Sleeve for Con Rod	05.0115	05.0116		05.0117
17c	Hexagon Nut	07.0598			
18	Pump V-belt Pulley	19.0010	19.0006		19.0004
18a	Hexagon Screw w/Pointed Extension	21.0161			21.0110
18b	Motor V-Belt Pulley	19.0039	19.0040	19.0052	19.0053
18c	Pointed Threaded Stud	21.0157			
19	Motor Mounting Rail left	23.0001			23.0016
192	Motor Mounting Rail right	23.0119			23.0120
19a	Hinge Pin with Thread	11.0333	11.0332		11.0331
19b	Hinge Pin	11.0235			11.0082
19c	Hexagon Screw	21.0116			21.0115
19d	Insulation Sleeve	07.0161			07.0162
19e	Hexagon Nut	07.3001			07.2398

Part No.	Description	PM10	PM15	PM20	PM30
191	Hexagon Screw	21.0290			21.0256
	Motor Rocker Assy	00.2441		00.2442	00.2443
20/21	Diaphragm Safety Valve c/w Seat + Seal 4 bar	00.1303			
20/21	Diaphragm Safety Valve c / w Seat + Seal 6 bar	00.1304			
20x	Gasket for Safety Valve Casing	06.0395			
21	Safety Valve Seat Assy	00.3205			
21x	Gasket for No 21	06.0312			
22	Acorn Nut for Air Chamber	07.0485		07.1257	07.1258
22a	Air Chamber Stud Bolt	21.0197	21.0044	21.0195	21.0198
22b	Disc	07.1259		07.1211	07.1296
23	Crosshead	17.0001		17.0004	17.0005
23a	Crosshead Pin	11.0354		11.0355	11.0356
24	Oil Indicator with Nut	00.1958		00.1953	-
	Oil Level Gauge	-	-	-	00.1938
24x	Gasket	06.0054		060312	
26	Oil Splash Cap	03.0100		03.0118	03.0098
27	Oil Scraper	06.0397		06.0408	06.0417
28	Oil Filler Plug w/o Thread	07.0489			
29	Snifting Valve G3/8 with Stop Screw	00.1939			
	Snifting Valve G3/8 with Hose Nipple	00.1940			
29a	Snifting Valve Lip	06.0398			
29x	Gasket for Snifting Valve	06.1020			
30	Grooved Ball Bearing (outside)	05.0111		05.0110	
30a	Grooved Ball Bearing	05.0151		05.0156	05.0152
30b	Grooved Ball Bearing (Pump Pulley side)			05.0156	
31	Bearing Cover (closed)	03.0034		03.0182	
32	Bearing Cover (open)	03.0184		03.0028	
32a	Radial Shaft Seal	06.0399		06.0409	
32x	Gasket for Bearing Cover	06.0448		06.0449	
32c	Hexagon Screw	21.0315		21.0125	
33	Plug	07.0751		07.2803	
33x	Gasket	06.0312		06.1020	
34	V-Belt	07.1261		07.1288	07.1298
35	Crankshaft	11.0024		11.0025	11.0026
35k	Woodruff Key	07.1200			
36	Spacer Blocks	07.2244			07.1299
36a	Hexagon Nut	07.0598			07.3001
36b	Nut w/round Spigot	-	-	-	07.1238
37	Base Plate	23.0013		23.0015	23.0095
	Base Plate with Spacer Blocks and Nuts	00.2445		00.2446	00.2447
38	Hexagon Screw	21.0290			
xx	Complete Set of Gaskets	00.2449	00.2450	00.2451	00.2452
	Crankcase Assy	00.2820	00.2821	00.2822	00.2823
	Crankcase Assy	00.3185	00.3186	00.3187	00.3188
	Pump Head Assy with Safety Valve 4bar	00.2614	00.2625	00.2615	00.2616
	Pump Head Assy with Safety Valve 6bar	00.2737	00.2738	00.2739	00.2740
	Air Volume Control	00.2479			
	Air Hose 0.9m	32.0006			
	Drain Cock G1/4	00.1941			
	Gasket G1/4	06.0312			
Part No.	Description		FPM80	FPM100	FPM150
5	Air Chamber		01.0200		
5A	Diaphragm Pressure Tank 8.0 Litre		00.2796		
5B	Pressure Switch		08.0077		
5C	Pressure Gauge		31.0009		
5D	T-Piece galvanized		07.1280		
5E	Double – Nipple galvanized		07.2246		
5F	Elbow Fitting galvanized No. 92		07.0602		
5G	Elbow Fitting galvanized No. 94		07.1282		
5H	Reducing Nipple galvanized		07.1283		
5J	Counter Nut G3/4 galvanized		07.2738		
22	Hexagon Nut		07.0988		
29	Plug		07.2803		
29x	Gasket		06.1020		
18b	Motor V-Belt Pulley	19.0109	--	--	
	Base Plate with Spacer Blocks and Nuts		00.2448		
	Air Chamber Assy		00.3189		
	Pump Head Assy		00.2626		00.2627

1.52 Exploded View



When ordering spare parts, please state item number and code number of the part required as well as the pump model and year of construction which can be found on the name plate.

2. Safety

This Operation Manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. It is therefore imperative that this manual be read by the responsible personnel/operator prior to assembly and commissioning. It is always to be kept available at the installation site. It is not only the general safety instructions contained under this main heading `Safety` that are to be observed, but also the specific information provided under the other main headings.

2.1 Identification of Safety Instructions in the Operating Manual

Safety instructions given in this manual, non-compliance with which would affect safety,

are identified by the following symbol:



see DIN 4844 - W9



- or where electrical safety is involved, with

see DIN 4844 - W8

Safety measures which can cause damage to the machine if not adhered to, are marked

Important!

It is imperative that signs affixed to the machine, e.g.

- arrow indicating the direction of rotation
- symbols indicating fluid connections

be observed and kept legible.

2.2 Qualification and Training of Operating Personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover, the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

2.3 Hazards in the Event of Non-Compliance with the Safety Instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine, and results in a loss of any right to claim damages.

For example, non-compliance may involve the following hazards:

- Failure of important functions of the machine/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment owing to hazardous substances being released.

2.4 Compliance with Regulations pertaining to Safety at Work

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

2.5 Safety Instructions Relevant for Operation

- If hot or cold machine components involve hazards, they must be guarded against accidental contact.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be prevented (see for example the VDE Specifications and the by-laws of the local power supply utilities).

2.6 Safety Instructions Relevant for Maintenance, Inspection and Assembly Work

It shall be the plant operator's responsibility to ensure that all maintenance, inspection and assembly work is performed by authorized and qualified personnel who have adequately familiarized themselves with the subject matter by studying this manual in detail.

Any work on the machine shall only be performed when it is at a standstill.

Pumps and pump units which convey hazardous media must be decontaminated.

On completion of work, all safety and protective facilities must be re-installed and made operative again.

Prior to restarting the machine, the instructions listed under `Operation` are to be observed.

2.7 Unauthorized Alterations and Production of Spare Parts

Modifications to the machine are only admissible after consent by the manufacturer. Using spare parts and accessories authorized by the manufacturer is in the interest of safety. Use of other parts may exempt the manufacturer from any liability.

2.8 Unauthorized Modes of Operation

The reliability of the machine delivered will be only guaranteed if it is used in the manner intended, in accordance with clause 1 `In General` of this manual. The limit values specified in the data sheet must under no circumstances be exceeded.

Existing Standards and other Data

DIN4844 Part 1: Safety descriptions and safety signs W8 - supplement sheet 13

DIN4844 Part 1: Safety descriptions and safety signs W9 - supplement sheet 14

3. Transport and Storage

Pumps and pump units must not be stored for any length of time in a humid place or where temperatures are below zero. The storage room should be airy as dampness will ruin the motor and in turn void the warranty.

Pumps are packed for transportation in cardboard boxes or on pallets. When unpacking, check for damage.

4. Description

4.1 "Pumpmeister"

SPECK piston pump series "Pumpmeister" have drop-forged crankshafts in silent running ball bearings, a crank mechanism which has proved itself over and over again. When turned in the correct direction, the gear is lubricated by an oil-dip bath with flooded crosshead. Suction and discharge connections are on the valve casing and are interchangeable. Valve case, air chamber, stuffing box and cylinder are of grey cast iron (GG20).

The brass suction and discharge valves (2 of each) are made easily accessible by removing the air chamber. The suction/discharge line does not have to be removed.

The brass cylinder sleeve is pressed into the valve casing.

The duo-piston is of NBR rubber.

Teflon-impregnated packing rings are used for the piston rod sealing in the stuffing box.

A built-in diaphragm safety valve protects against excess pressure. Water will not flow out of the pump if the pressure is too high. Surplus water is circulated within the pump, back to the suction side.

4.2 "Pumpmeister" Freshwater Unit

The freshwater "Pumpmeister" FPM unit is an automatically functioning water unit designed for smaller scaled requirements. It is equipped with a diaphragm pressure tank, pressure switch, electric motor and pressure gauge.

The large effective volume of the attached diaphragm pressure tank ensures constant air-free flow. Air regulation by the sniffling-valve is unnecessary.

These compact pump units are based on the successful piston pumps of the PM "Pumpmeister" series.

4.3 "Pumpmeister" Pump Unit

SPECK pump units are "Pumpmeister" piston pumps on galvanized horizontal pressure tanks, complete systems ready for connection. They are equipped with electric motor, V-belt pulleys, V-belts, belt-guard, automatic air volume control, pressure switch, pressure gauge and a built-in safety valve.

The automatic air volume control installed in the pressure tank of the unit automatically ensures the correct ratio between water content and the necessary air cushion.

If the horizontal tank is half full, the valve of the automatic air volume control, activated by the float, opens and the pump sucks in air thus conveying an air/water mixture into the tank.

Suction head should be 4-6 metres in order to ensure that the pump absorbs air in the correct manner.

When water leaves the tank, the pressure therein will gradually drop until it eventually sinks to the automatic switch-on point which activates the pressure switch to turn the pump and motor on. The amount of water which left the tank is pumped in again till the switch-off level is attained. This procedure repeats itself again and again at irregular intervals, depending on how often water is withdrawn from the tank.

4.4. Pressure-Switch Adjustment Values

Pump Unit 4 bar:	Switch-On Pressure:	2 bar
	Switch-Off Pressure:	3.5 bar

Pump Unit 6 bar	Switch-On Pressure:	3 bar
	Switch-Off Pressure:	5.5 bar

5. Set-Up and Installation (to be done only by skilled persons)

5.1 Pump Unit

The complete pump unit with horizontal pressure tank is supplied ready assembled. A special foundation is not necessary. The tank can be fixed to the foundation by 4 spacer blocks.

Important!

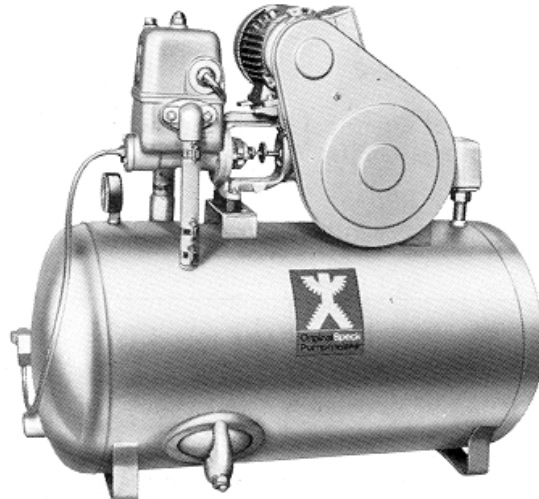
The room must be frost-proof and dry. It should also be well aired in order to prevent undesirable moisture condensate forming on the unit. Damp air can damage the motor.



Each pump is to be equipped with a belt-guard which conforms to trade union and general safety rules.



The pump-motor must be protected by a correctly adjusted motor protector.



"Pumpmeister" Pump Unit: Pump and motor, horizontal pressure tank and belt-guard

5.2 Pump Unit with Vertical Tank

Assembly:

In contrast to the pump units with horizontal tanks which are supplied ready assembled, the units with vertical tanks have to be set up and fitted by a plumber at the site of installation. They function the same as the ready assembled units. However, we draw your attention to the fact that an automatic air volume control can also be installed in a vertical tank when the unit is being set-up (s. Fig. 113). Directions (D10672) for installing the automatic air volume control are available upon request.

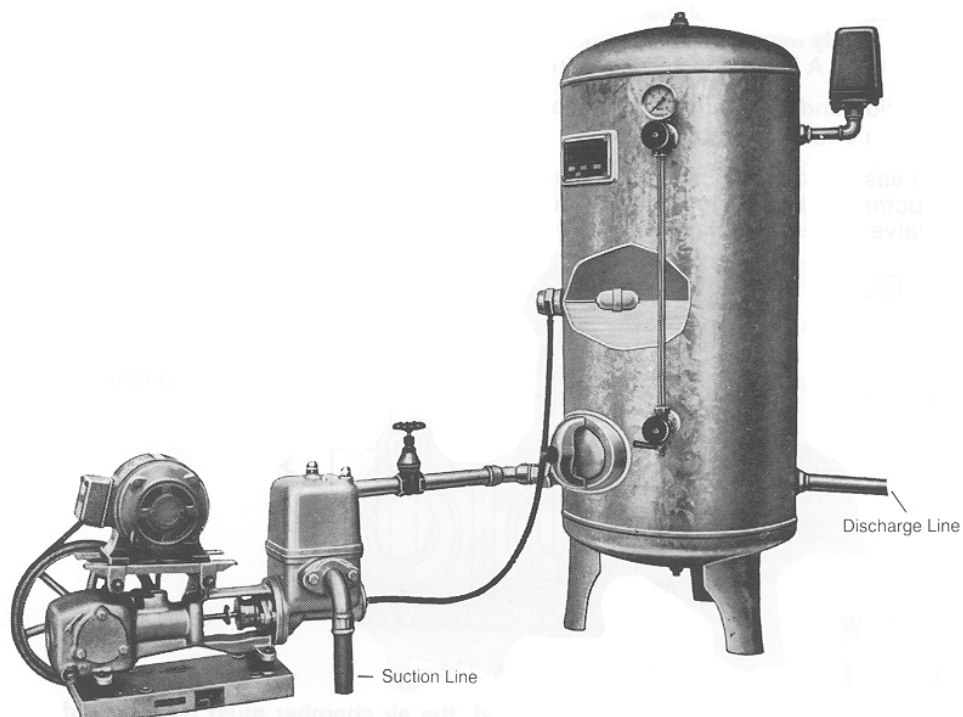


Fig. 113 "Pumpmeister" pump unit with vertical tank.

5.3 “Pumpmeister”

Single “Pumpmeister” piston pumps are anchored to a brick or concrete base. No particular kind of foundation is required for the vertical tanks. Pumps which don't have a base plate must be mounted onto a piece of anti-vibration material placed between the pump and the floor.

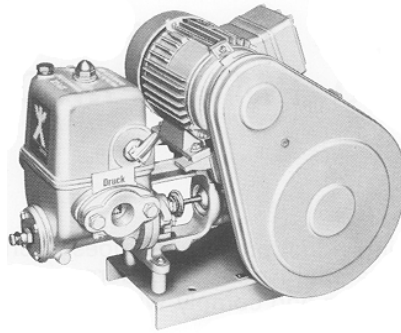


Fig. 112 “Pumpmeister”

5.4 Suction Line for Pump Units and “Pumpmeister” Pumps

Important!

Perfect functioning of the pump depends largely on well laid-out suction lines. In order to prevent air-pockets, the suction line should rise gradually from the well to the pump or should at least be layed horizontally. It must be absolutely seal-proof and the inner diameter should be at least as large as the connection on the pump. Only bows are to be used, no elbows. It is advisable to install a foot valve or an intermediate valve in the case of a closed filter well. If suction lines are longer than 30 m, a suction air chamber is to be installed right in front of the pump. If vertical tanks are used (Fig. 113), it is advisable to support heavy suction lines so that their weight doesn't pull on the pump.

5.5 Suction Head

Important!

The total gauged suction head which is the height between water level and pump plus loss of friction in pipe and possible filter resistance, is not to exceed 7.5 m, not forgetting that in dry seasons the water level in the well may be lower than usual.

If suction lines are very short or the suction head under 2 m, or where booster is present, a regulator valve (not a tilted valve seat) must be installed in the suction line directly in front of the pump. This regulator valve can be adjusted with greater accuracy to the required suction head, ensuring the avoidance of water-hammer.

5.6 Intake Pressure - Pump Unit as Booster Set

Important!

If the inlet pressure is more than 0.3 bar (3 m), it is advisable to install a pressure-free tank with float valve. If this can't be done, a regulator valve as described above must be installed. A vacuum of 4-6 m must be provided if the automatic air volume control is to function properly. If the pump hammers, a suction air chamber (approx. 7.5 litre) must be installed in the suction line. Moreover, a shut-off valve is necessary in a suction line with intake pressure so that the pump can be opened for servicing.

5.7 Discharge Line - Refers only to installation of pump units with vertical tanks or pumps alone

Important!

If possible, the line should slope upwards from the pump to the tank or at least be horizontal – it should never slope downwards. Only use bows; elbows can be used only after the tank. Install regulator valve between the pump and tank. A kick-back valve is unnecessary, it only causes noise.

5.8 To Exchange Suction and Discharge Connections

(Does not apply to units with horizontal tanks)

To make installation easier, the suction and discharge sides of SPECK “Pumpmeister” pumps can be interchanged by converting the suction and discharge valves. This often saves inconvenient installation of suction and discharge lines. Install clean valve seat gasket and make sure the valves sit properly.

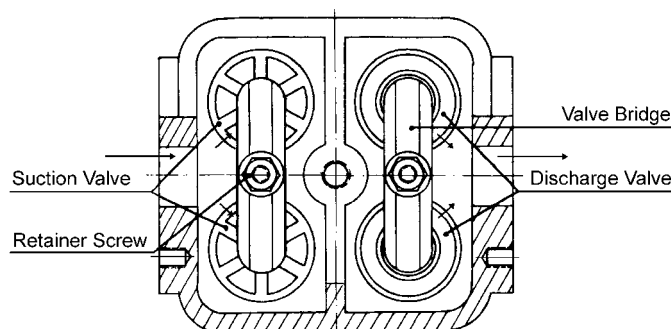


Fig. 114

After suction and discharge valves have been exchanged, the air chamber must be turned 180° around so that the safety valve is always located on the discharge side.

6. Operation

6.1 To Fill Pump with Oil

Important! Fill crankcase with an SAE30 quality oil through opening (28) above crosshead (23).

PM10	PM15	PM20	PM30
0.1 litres	0.1 litres	0.2 litres	0.3 litres

6.2 To Fill Pump with Water

Important! Fill up pump head with water by pouring the water in via filler plug (33). At the same time, turn the pump V-belt pulley (18) manually in the direction of the arrow. In the case of long suction lines, fill right up to the foot valve/intermediate valve (see 5.4).

6.3 Motor Alignment and Electrical Connection

Using a ruler, make sure that pump pulley and motor V-belt pulley (18/18b) are in line with each other. The motor could get pushed out of position during transport. If the pulleys do not align precisely, the belts will wear out quickly.



Electric motors must be connected as per circuit diagram which can be found in the terminal box of the electric motor. This work is to be carried out by suitably qualified persons.

6.4 Fittings

Open shut-off fittings and taps in the discharge line so that the air in the pipe system can escape.

6.5 To Switch on the Motor

Important! Check the direction of rotation. Reverse polarity if the motor is running in the wrong direction. Close the shut-off fitting only after water has begun being pumped, after the suction line and pump are vented (clearly visible through transparent tube – fig. 111/II) and after water has come out of the tap. Depending on the size of the tank, it takes between 5-15 minutes until the tank is full and the pressure switch switches off at either 3.5 bar or 5.5 bar.

6.6 To Let Water Out

Turn tap on and let water out. Pressure drops eventually to 2 or 3 bar respectively and the pump switches on again automatically. Only a few air bubbles should now be visible in the suction line, otherwise there is reason to believe that the suction is not correctly sealed. Approximately 2000 litres of water per hour flow out of an open G1/2 tap at 3 bar pressure.

6.7 On/Off Switching Pressure

(4 and 6 bar pump units)

Important! The pump unit has a diaphragm safety valve which is adjusted to an activation pressure of either 4 or 6 bar. The pressure tank is also approved for max. pressure of 4 or 6 bar. The pressure switch must therefore be adjusted to a maximum pressure of 3.5 bar / 5.5 bar otherwise it will activate the safety valve. To readjust switch-on / switch-off pressure, see instructions on pressure-switch (Fig. 111/IV).

Switching Stages:

4 bar Pump Unit	Switch-On Pressure	2 bar
	Switch-Off Pressure	3.5 bar
6 bar Pump Unit	Switch-On Pressure	3 bar
	Switch-Off Pressure	5.5 bar

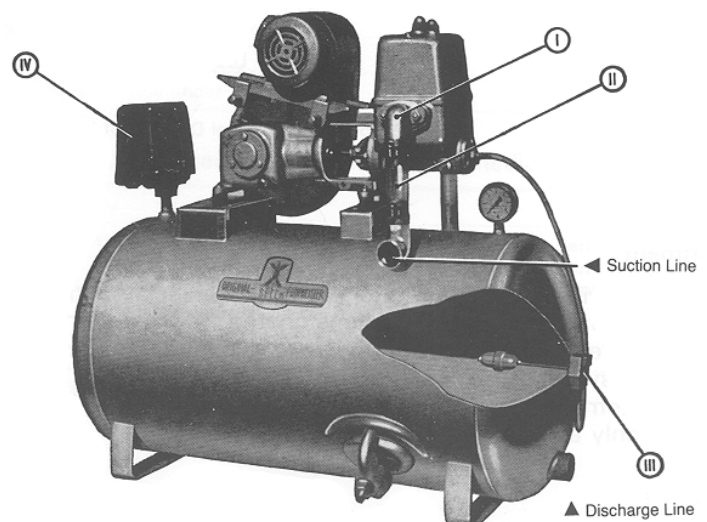


Fig. 111 "Pumpmeister" Pump Unit.

7. Maintenance and Servicing

7.1 Lubrication

Important! The gear is lubricated automatically providing the pump revolves in the correct direction. Oil level should be checked every three months and topped up if necessary till oil can be seen through the indicator glass (24). First oil change after 3 months operation and then every 2 years, or every 6 months if the pump is running continuously. This is done by unscrewing the indicator (24) or screw (16) and draining out the old oil. Then clean out the crankcase (removing tin lid item 2) and refill with fresh oil as described under paragraph 6.1.

7.2 Stuffing Box

Important! The compact stuffing box is made of Teflon-impregnated packing rings and a seal ring and requires practically no maintenance at all. If the stuffing box should drip, stuffing box nut (6a) must be tightened carefully by approx. one half turn. If this doesn't help, the whole stuffing box (6d) is to be replaced. In this case seal ring (6b) must also be replaced. The seal ring has to sit properly by having the lip ring spring face the piston.

7.3 V-Belts

Important! V-belts (34) should not be overtensioned. However, it is advisable to tighten them again after the initial first days of operation. When renewing V-belts on multi-belt drive, the complete set has to be replaced due to even tension.

7.4 Gear

Important! The gear of the original SPECK "Pumpmeister" consists of a forged-steel crankshaft which runs in two ball bearings. The conrod also has a ball bearing. Other than the servicing (lubrication) mentioned under 7.1, hardly any further maintenance is necessary for years. One should check every now and then to make sure the radial shaft seal (32a) on the gear wheel side is seal-proof and that there is no oil leakage.

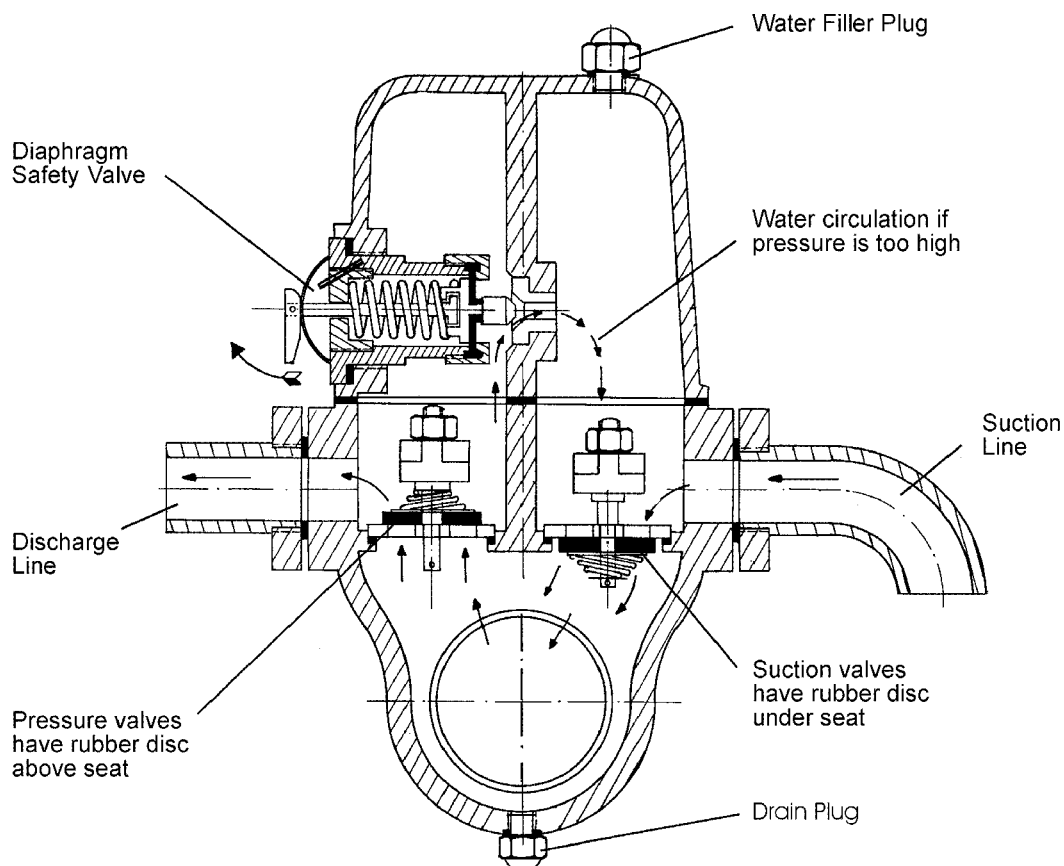


Abb. 115 Cross-sectional Diagram of Valve Casing

7.5 Air replenishment

Important! The pump will run smoothly and silently if there is air in the air chamber. This air cushion is kept under control by the automatic air volume control via the snifting valve. At the same time air is pumped into the pressure tank. The more air there is in the pressure tank, the more water can be discharged before the pump switches on again (s. 4.3).

If the automatic air volume control has to be repaired, kindly ask for our instruction sheet. The unit itself is only available as a complete set.

8. Failures and Remedies

If you have trouble with your pump, you may be able to help yourself by reading the tips we give you below. If you can't find the reason for the trouble, call a plumber or write to us, not forgetting to mention the pump model and its serial number.



Prior to doing any work on the pump, switch off the electricity and make sure that the pump is idle and the pressure at zero.

8.1 Little or no water at all is being pumped

Possible Reason	Remedy
a) Pump is running but delivers no water even though it is filled properly.	Remove air chamber (5) and loosen rubber valve discs (113/123). Valve rubber discs (113/123) have become stuck due to long storage period.
b) Not enough water in the pump.	Refill pump as explained in 6.2. During refilling turn the pump several times per hand pouring in water little by little till there are 2-4 litres in the pump. Screw on filler plug (33) again and seal carefully. More water may be necessary if the suction line is very long and the suction head very high.
c) Suction head too high / suction line too long.	Measure difference between water level and pump flange connection (fig. 111/I). Compare loss of friction in long pipes with table (available upon request) and add the difference in height.
d) Suction line is not seal-proof.	After the pump has been running for a while, check whether air bubbles can still be seen through transparent hose (Fig. 111/II) above elbow on tank. If so, locate the leak and seal it.
e) Soiled or worn-out valves.	Pebbles, hemp, shavings etc. often get absorbed into the pump if the well is new, so the air chamber (5) has to be removed and the valves checked. Unscrew nuts above valve bridge. Remove valve bridge and any crust which may be on it. Valves are not screwed in. If they are stuck, press them loose with the handle of a hammer. The valve seat seal is under the valve - make sure that the seat is clean. Rubber valve discs (113/123) may have to be replaced on old pumps.
f) Stuffing box is not seal-proof.	Tighten nut (6a) a little. If this doesn't help, replace packing rings (6d) and possibly seal ring (6b) as well. Do not use hemp, we use Teflon-impregnated packing rings.

8.2 Pump Knocks

Possible Reason	Remedy
a) There's no air cushion in the air chamber.	Make sure that the air volume control (Fig.111/III) is working properly. The snifting valve should hiss when the pump is running. Check whether rubber lip (29a) is dirty or clogged up. Air could be escaping through screw on filler plug, therefore check by covering sealing surfaces of air chamber and filler plug with a soap solution.
b) Pre-pressure in pump.	Water level in pump/air chamber is too high because snifting valve hasn't absorbed enough air. Install regulator in suction line (s.5.5/5.6). Pump should run with about 5 metre vacuum ensuring that sufficient air is drawn.
c) Pump suction head is very low.	Same applies here as explained under b). A vacuum must be provided by means of a regulator so that sufficient air will be pumped.
d) High suction head - long suction line.	Install a suction air chamber as per 5.4 and ensure sufficient ventilation. Make sure there's enough water in the well, e.g. after a dry season.
e) Conrod bearings in pump out of place.	You can't always determine the reason for the knocking by ear, so you have to turn the V-belt pulley (18) backwards and forwards to determine any clearance between bearing and conrod. Repairs to the gear are best done by a skilled tradesman.
f) The pump V-belt pulley deflects and does not sit properly on the crankshaft.	As described under e).
g) One of the ball bearings is defective.	As described under e).

8.3 Pump switches on when very little water is discharged and switches off immediately the tap is turned off

Possible Reason	Remedy
The air cushion in the tank is not big enough. During initial operation, there may not have been enough air pumped into the tank or the air the pump has drawn into the tank is escaping somewhere (pressure switch, pressure gauge, air volume control, pump connections, transport damage).	If snifting valve and air volume control are working properly (111/III) and there still isn't enough air in the tank, coat all connection threads on tank with a soap solution to determine where it is leaking. It is also possible that the pressure switch (111/IV) isn't air-tight.

8.4 Pump switches on automatically although taps are turned off

Possible Reason	Remedy
a) A tap is leaking or air is escaping from the tank.	Check by switching off the complete unit overnight. Turn off all taps and check whether the pressure drops.
b) Leaky valves or leaky safety valve cause water to run back into the well.	Open pump and check whether the valves close tightly.
c) Foot valve/intermediate valve in the suction line leaks. Water runs back into the well.	Switch pump off and open safety valve at 3.5/5.5 bar. If the foot valve/intermediate valve is working properly, no return flow should be heard (or seen at pressure gauge of tank) immediately after the lever (214) has been lifted.

8.5 Air escapes from tap when water is let out

Possible Reason	Remedy
a) There's too much air in the tank. The well water is probably very gassy and a lot of air separates in the tank. If the suction line is very long and the suction head high, it could be that too much air is being pumped.	In this case, it is advisable to disconnect the pipe of the air volume control for a while or install a special rubber lip with a very small hole into the snifting valve.
b) Suction line leaks.	Find leak and seal it.

8.6 Water is pumped easily till shortly before switch-off pressure is reached where after the pump continues to run but doesn't pump any water because it can't reach the final pressure

Possible Reason	Remedy
This can happen if too much air is pumped through the air volume control when suction lines are very long and suction head very high. This often occurs when the suction line isn't absolutely seal-proof and allows even more air to get into the pump. It can also be caused by worn rubber valve plates, worn cylinder or pistons.	We recommend either installing a rubber lip with a very small hole or to disconnect the tube of the air volume control from time to time. Replace rubber valve plates (113/123). Check whether piston or brass cylinder are worn and replace as necessary.

8.7 Water leaks at Air Volume Control

Possible Reason	Remedy
Rubber lip of snifting valve (29) is damaged.	Replace rubber lip (29a).

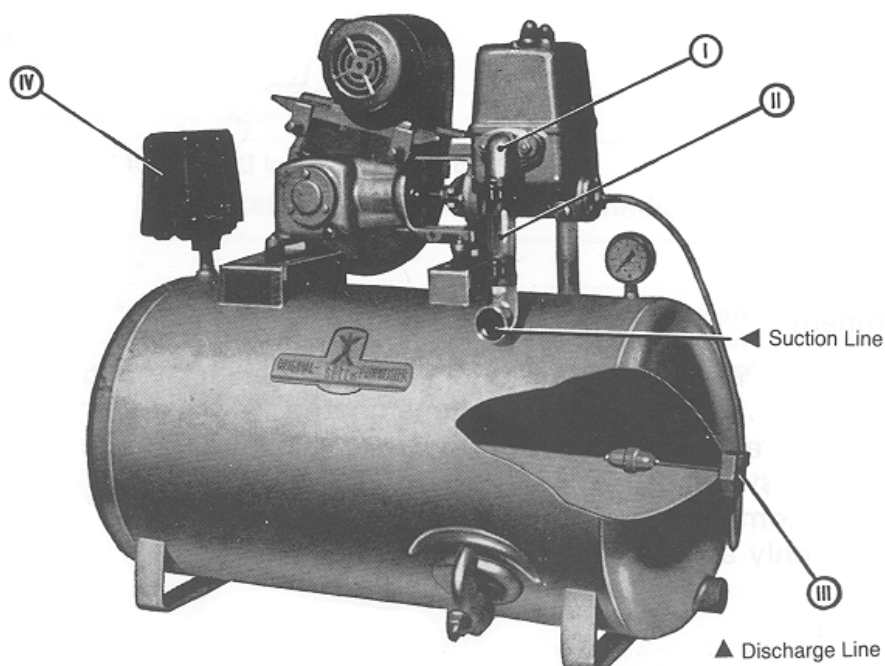


Fig. 111 "Pumpmeister" Pump Unit